

A New and Inexpensive Tool for Ozone, Aerosol, and AOD Vertical Profiling

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Frequent vertical profile measurements of ozone (O_3), aerosol, and aerosol optical depth (AOD) are highly desired for emission, pollution transport, and monsoon studies. Three requirements necessary for a successful program are: Low equipment cost, low operation cost, and reliable measurements of known uncertainty. Conventional profiling using aircraft provides excellent data, but is cost prohibitive on a large scale. Here we describe a new tool (a new platform and instruments) meeting all three requirements. The platform consists of a small balloon and an auto-homing glider. The glider is released from the balloon at a preset altitude (nominally 5 km), returning the light instrument package to the launch location, and allowing for consistent recovery of the payload. Atmospheric profiling can be performed either during ascent or descent (or both) depending on measurement requirements. We will present the specifications for two instrument packages currently under development. The first measures O_3 , relative humidity, pressure, temperature, dry aerosol particle number and size distribution, and aerosol optical depth. The second measures dry aerosol particle number and size distribution, and aerosol absorption coefficient. Results of test flight series for the proof of concept will be shown.

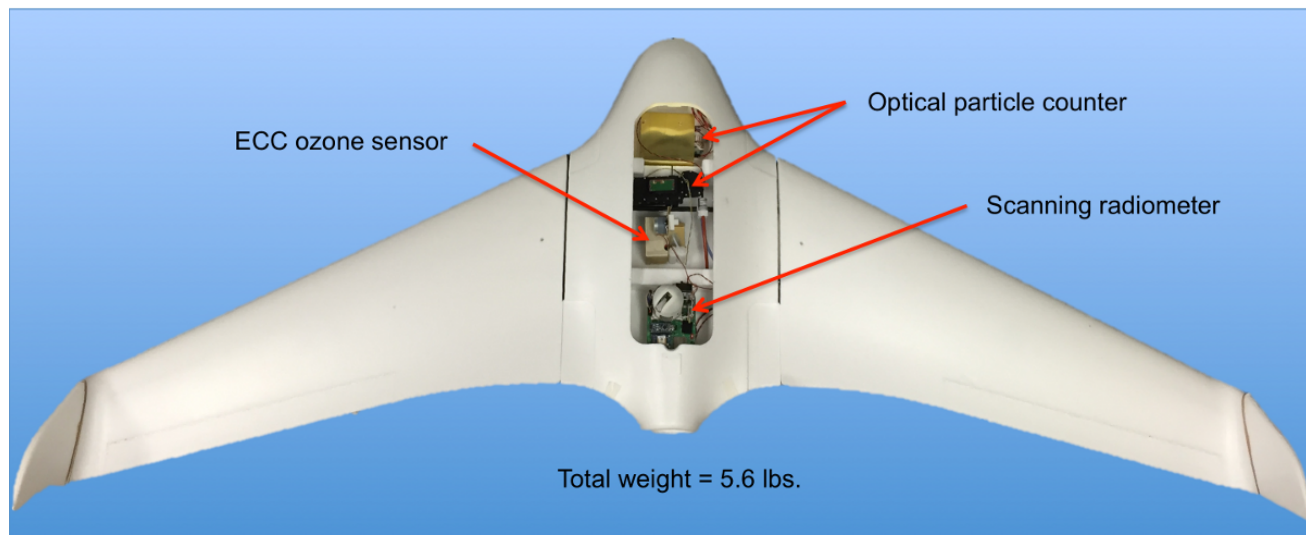


Figure 1. The prototype glider (a Skywalker X8 model plane without its electric propulsion system) with an optical particle counter, an ECC ozone sensor, and a scanning radiometer. The total weight is 5.6 lbs.